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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,244	12/12/2003	Nasser H. Kutkut	054603-0113	9806

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EXAMINER	
GRANT, ROBERT J	

ART UNIT	PAPER NUMBER
2838	

DATE MAILED: 01/25/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/735,244	KUTKUT ET AL.	
	Examiner	Art Unit	
	Robert Grant	2838	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7,9 and 12-20* is/are rejected.

7)☒ Claim(s) *8 and 10-11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

1. Claims 1-4 and 12-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Kutkut et al (US 6,549,014).

As to Claim 1, Kutkut discloses a battery monitoring apparatus that obtains a current measurement for a current in a conductive element, the battery monitoring apparatus comprising: conductive lines configured to couple to a conductive element having an electrical current (Figure 5, element 25); a filter coupled to the conductive lines and configured to filter noise from a signal derived from a voltage difference between the conductive lines, the voltage difference being related to the current in the conductive element (element 93 and columns 3, lines 22-24); an analog-to-digital converter that converts the signal filtered by the filter and outputs a digital signal(element 97); and a controller that receives the digital signal from the analog-to-digital converter (figure 2, element 44).

As to Claim 2, which is dependent upon claim 1, Kutkut discloses wherein the conductive element comprises a direct current (DC) shunt (figure 5, element 89).

As to Claim 3, which is dependent upon claim 1, Kutkut discloses further comprising an operational amplifier circuit configured to filter the signal filtered by the filter (Figure 5, element 91,92,94, and 95).

As to Claim 4, which is dependent upon claim 3, Kutkut discloses wherein the filter, the analog-to-digital converter, the controller, and the operational amplifier circuit are located on a current sensing microprocessor card (figure 2).

As to Claim 12, Kutkut discloses a battery monitoring apparatus comprising: (a) a voltage sense input port to which leads extending to a battery may be connected such that a signal representing the voltage across the battery is provided to the voltage sense input port (Figure 2, element 16 and 17); (b) a current sense input port to which leads extending to a universal current measuring apparatus may be connected such that a signal representing the current through the battery is provided to the universal current measuring apparatus (Figure 2 and 5, element 25), wherein the universal current measuring apparatus comprises a filter to remove noise from received signals (figure 5, element 93), an analog-to-digital converter to convert an analog current signal to a digital signal (figure 5, element 97), and a controller programmed to monitor the digital signal representative of the current to detect a change in battery state from one of the states of battery charging, discharging, and open circuit to another state, and to define a battery event between changes of state (column 2, lines 42-45); (c) an output communications port through which data may be communicated (figure 2,

element 28); (d) a non-volatile memory (figure 2, element 57); and (e) a programmable microcontroller connected to the voltage sense to receive signals therefrom and connected to the output communications port to at least transmit signals thereto, the microcontroller connected to provide data to and from the non-volatile memory, the microcontroller, to monitor the battery voltage during each event, and to selectively transfer data from the non-volatile memory through the output communications port after a period of time in which events have occurred (figure 2, element 44).

As to Claim 13, which is dependent upon claim 12, Kutkut discloses further including a temperature sense input port coupled to the universal current measuring apparatus to receive a signal therefrom during a battery event (Figure 2, element 53).

As to Claim 14, which is dependent upon claim 12, Kutkut discloses wherein the universal current measuring apparatus connected in series with the battery to detect the level and direction of current flowing through the battery, the current sensor including an analog to digital converter to convert the signal corresponding to battery current level and direction to a digital data signal which is connected by a digital data communications link to the current sense input port (Column 4, lines 25-29 and Figure 5, element 97).

As to Claim 15, which is dependent upon claim 14, Kutkut discloses wherein the universal current measuring apparatus components are mounted on a printed circuit board connected to the shunt, the printed circuit board having a ground plane formed on a first side of the board, and current sense tracks printed on an opposite side of the board which extend from terminals connected to the shunt to a filter, the filter connected to provide a filtered signal to the amplifier and analog to digital converter on the printed circuit board (Column 10, lines 9-21).

As to Claim 16, which is dependent upon claim 14, Kutkut discloses wherein the universal current measuring apparatus is coupled to a shunt (element 89) of a known resistance through which flows the current flowing through the battery, an amplifier connected to receive the voltage across the shunt, a filter to low-pass filter the signal from the amplifier (elements 94 and 95), the analog to digital converter connected to receive the filtered output signal from the amplifier and providing a digital output data (Figure 5,element 97).

As to Claim 17, which is dependent upon claim 16, Kutkut discloses wherein the universal current measuring apparatus includes a high gain amplifier and a low gain amplifier, each amplifier connected to receive the voltage across the shunt, wherein the analog to digital converter includes a first channel connected to receive a filtered output from the high gain amplifier and a second channel connected to receive a filtered output from the low gain amplifier, the controller programmed to selectively receive the

current sense data from the first analog to digital converter channel when the current being sensed is below a threshold value and from the second analog to digital converter channel when the current being sensed is above a threshold value (figure 5, elements 91 and 92).

As to Claim 18, which is dependent upon claim 17, Kutkut discloses wherein the high gain amplifier saturates at a selected current level and the controller is programmed to select data from the second analog to digital converter channel when the data from the first analog to digital converter channel is at the saturation level of the signal from the high gain amplifier (column 9, lines 51-57).

As to Claim 19, which is dependent upon claim 12, Kutkut discloses wherein the microcontroller is programmed to store one or more stationary data fields in the non-volatile memory selected from the group consisting of installation time, high voltage setpoint, low voltage setpoint, high current setpoint, high temperature setpoint, battery nominal capacity in ampere hours, battery nominal voltage, a cycle counter, total hours of open circuit overall events, total hours of discharge overall events, total hours of charge overall events, total amp-hours of discharge overall events, total amp-hours of charge overall events, and a count of the number of events recorded (Column 6, lines 41-53).

As to Claim 20, which is dependent upon claim 19, Kutkut discloses wherein the microcontroller is programmed to store all of the stationary data fields from the group of stationary data fields (column 6, lines 30-35).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kutkut et al. in view of Bertness et al. (US 6,850,037).

As to claim 5, which is dependent upon claim 1, Kutkut discloses a temperature sensing circuit, but foes not expressly disclose what is being used to sense the temperature. Bertness teaches to use a thermistor as a way of detecting the temperature of a battery (column 10, lines 33-36). It would have been obvious to a person having ordinary skill in the art at the time of this invention to use the thermistor as taught by Bertness in the temperature sensing circuitry of Kutkut, in order to achieve the temperature monitoring as Kutkut describes.

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kutkut et al. in view of Bertness in further view of Ribes (US 6,522,123).

As to Claim 6, Kutkut in view of Bertness disclose the battery monitoring apparatus of claim 5, wherein the thermistor provides temperature information. Neither Kutkut nor Berntess teach of the temperature correcting factor. Ribes teaches of usinge a temperature correction factor according to the formula: TCF = R (T) R (T o) = 1 + TCx (T - T o) where To is the reference temperature at which calibration is performed, R(T.sub.o) is the resistance at a reference temperature, R(T) is the resistance at a desired temperature, and TC is the temperature coefficient of resistance of the conductive element (Column 2, lines 45-67 and Column 3 lines 1-9). It would have been obvious to one having ordinary skill in the art at the time of this invention to use the temperature correction factor as taught by Ribes with the device of Kutkut in view of Bertness in order to have a more accurate measurement.

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kutkut et al. in view of Palmisano et al (US 6,544,078).

As to Claim 7, Kutkut discloses the battery monitoring apparatus of claim 1. Kutkut does not expressly disclose a clamp-on meter configured to measure an actual current

in a batter measurement. Palmisano teaches of a clamp-on meter to measure the current (figures 5). It would have been obvious to a person having ordinary skill in the art at the time of this invention to combine the teachings of Palmisano clamp, with Kutkut's monitoring circuitry in order to allow a current reading of the desired source with out the interference from unrelated electronic circuitry.

6. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kutkut et al. in view of Ribes (US 6,522,123).

As to Claim 9, Kutkut discloses a method for obtaining a current in an activity-based battery monitoring apparatus, the method comprising: filtering a signal from wires coupled to a conductive element, the signal resulting from a voltage drop across the conductive element (figure 5, element 25 and 93); converting the signal from an analog form to a digital form (element 97). Kutkut does not expressly disclose using a temperature correcting factor. Ribes teaches a TCF = R (T) R (T o) = 1 + TCx (T - T o) where To is the reference temperature at which calibration is performed, R(T.sub.o) is the resistance at a reference temperature, R(T) is the resistance at a desired temperature, and TC is the temperature coefficient of resistance of the conductive element (Column 2, lines 45-67 and Column 3, lines 1-9). It would have been obvious to one having ordinary skill in the art at the time of this invention to use the temperature

correction factor as taught by Ribes with the device of Kutkut in view of Bertness in order to have a more accurate measurement.

Allowable Subject Matter

7. Claims 8 and 10-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is a statement of reasons for the indication of allowable subject matter: Claims 8 and 10-11 recite, inter alia, a measuring device wherein a sensed current is measured with the device, and that sensed current is compared with an actual current measurement, and from them a correction factor or line is formed. The art of record does not teach, disclose, or suggest the above modification, nor would it have been obvious to one of ordinary skill in the art to modify the art of record to do so.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert Grant whose telephone number is 571-272-2727. The examiner can normally be reached on M-F 8:30-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Sherry can be reached on 571-272-2084. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

RG

KARL EASTHOM
SUPERVISORY PATENT EXAMINER